

Artifact

Questioning Your Student I - Computer Science

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When thinking about using Multiple Intelligence (MI) theory for teaching computer science, when you start learning programming, you initially learn a thing called “pseudocode,” which is basically a plain-language way of writing out exactly what you want the program to do. Pseudocode would probably fit the *linguistic* portion fairly well. And if we think about the traditional textbooks that most computer science classes have, you can see how they would also fit into the *linguistic* category as well (reading and all that). Programming itself deals with logically breaking down a problem, and writing a program to satisfy your requirements (usually involving numbers and variables). That problem-solving and writing portion is a perfect fit for *logical-mathematical*. Since *bodily-kinesthetic* can be engaged using the physical experience and movement of performing an action (Chapman, n.d.), this works well because I feel the best way to learn programming is through practice. Write code and compile it, and either work through the errors until it compiles, or run it and see what the results are. *Spatial-visual* intelligence can benefit from pictures, shapes, and images (Chapman, n.d.), so any lecture or presentation I would give would include images of what is expected, and diagrams laying out difficult concepts. Additionally, flowcharts are sometime used in place of pseudocode to lay out how a program will function via diagrams, so I would probably give students the option to lay out their programs using either method to accommodate the widest variety of learner.

Moving on to wait time, by increasing the time given to students to answer question, you’re giving the students more time to think on an issue. This leads to deeper thinking, and according to Fredericks, also has the benefits of increasing student confidence, participation, and achievement (as cited by TeacherVision.com, n.d.). Fredericks also mentions that in addition to increasing wait time, teachers shouldn’t identify who will answer the question initially, but leave the question open to all students. This way, all students will have an opportunity to think on the issue equally. For me, I like this second idea, because it allows me to build in wait time to the question itself. I can ask a question to the entire class, and then take a few seconds to look around the room at each student. I can see who is thinking on it (maybe who isn’t), and then choose who to answer the question. Likewise, once a student has given a response, I can do the same thing (looking around the room), and see who is thinking about the answer (who agrees or disagrees), and then possibly call on another student to expand on or refute the initial student’s response. This might lead to some good discussion.

And as for websites on Multiple Intelligence, I found two really interesting ones. The first website I cited above (<http://www.businessballs.com/howardgardnermultipleintelligences.htm>), and what I liked most is the table mid-way through the website, which lists the 7 original intelligences, plus the typical roles, related tasks, and preferred learning styles. I also like that it listed the original intelligences first identified by Gardner, but also lists and briefly talks about the 3 additional intelligences that Gardner suggested are possible. The second website was basically a case study on how a school district used MI theory to modify their gifted and talented program, and discusses the benefits that resulted

<http://www.ascd.org/publications/educational-leadership/sept97/vol55/num01/Using-Multiple-Intelligence-Theory-to-Identify-Gifted-Children.aspx>).

References

Chapman, A. (n.d.). Howard Gardner's Multiple Intelligences. Retrieved from <http://www.businessballs.com/howardgardnermultipleintelligences.htm>

TeacherVision.com (n.d.). Your Secret Weapon: Wait Time. Retrieved from <https://www.teachervision.com/teaching-methods/new-teacher/48446.html>

[Follow up response to Professor Fazio, asking for clarification on how I would call on students to answer questions in class.]

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I suppose who I would choose would depend on the performance of the students for that class. Although there may be points where I would want to call on a student that I know would give a solid answer, there are also points where I would probably want to call on someone who was having trouble (or maybe not paying attention).

The textbook advises to not ask questions to control misbehavior, which could apply to a student who is not paying attention. But I would want the student who wasn't paying attention to give an answer. Maybe he wasn't paying attention because he knows the subject, and is bored. Maybe he's lost, and having trouble focusing, so he zones out. Seeing how he responds (or fails to respond) might clue me in to the underlying issue.

Also, there may be times where I call on a solid answer student first, and then follow up with a question to a student who may be having issues. This way, the solid answer student can lay the foundation of an answer, and maybe even stimulate the student who is having issues. If I ask "give me a variable type," some students may not understand what I mean (particularly if English isn't their primary language). But if a student responds to my question with "integer," a student who is confused by my question might recognize what I was asking, and they could follow up with "boolean" or something similar.